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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,261	04/19/2004	Su Tao	4459-147	9419
22429	7590	05/18/2005	EXAMINER	
LOWE HAUPTMAN GILMAN AND BERNER, LLP 1700 DIAGONAL ROAD SUITE 300 /310 ALEXANDRIA, VA 22314			CHU, CHRIS C	
			ART UNIT	PAPER NUMBER
			2815	

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/826,261

Applicant(s)

TAO, SU

Examiner

Chris C. Chu

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 May 2005.
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 23 is/are pending in the application.
4a) Of the above claim(s) 8 - 23 is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1 - 7 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 19 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/6/05.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I and Species I (claims 1 – 7 and Figs. 4 – 13) in the reply filed on May 6, 2005 is acknowledged. The traversal is on the ground(s) that

a. Applicant asserts that the Examiner has failed to demonstrate why the proposed alternative method of invention II would constitute a materially different method. This is not found persuasive because the restriction set forth a materially different method of cutting step vs no cutting step, and these methods are, in fact, materially different because the cited different processing methods entail different processing steps and apparatuses. Further, the restriction did demonstrate how no cutting step would produce the device by forming the plurality of micromachine package without cutting the wafer.

b. Applicant has argued that the search and examination of the entire application can be made without serious burden since both inventions I and II can be covered in a single search. This is not found persuasive. Since each invention requires separate examination and search in different classes and subclasses (i.e., 257class and 438 class), the examination of the entire application is a serious search burden.

c. Applicant has argued that, with respect to the species restriction, there is no basis provided for designating the divided species as patentably distinct. This argument is not persuasive because the restriction set forth the mutually exclusive characteristics of the species, which is the basis for patentable distinctness.

The requirement is still deemed proper and is therefore made FINAL.

Information Disclosure Statement

2. The listing of references (U. S. Pat. No. 5,323,051) in the specification (page 2, line 22) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A (1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Drawings

3. The drawings are objected to because:

- (A) In Fig. 6, the reference number "200" should be --220--.
- (B) In Fig. 7, the reference number "221" should be --211--.
- (C) In Fig. 10, the reference number "100" should be --300--.
- (D) In Fig. 18, the reference number "510" should be --510'--.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "118" and "112" in Fig. 7 have both been used to designate solder pads.

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Art Unit: 2815

- (A) In Fig. 17, the reference numbers “516”, “512”, “530”, “522”, “526”, “542”, “546”, “524”, “548”, “540”, “544” and “514” are not referenced in the specification of instant invention.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

- (A) On page 4, line 29, “110” should be --100--.
- (B) On page 8, line 15, “lid 510” should be --lid 510’--

Appropriate correction is required.

Claim Objections

7. Claim 1 is objected to because of the following informalities:

- (A) Line 2, "chip," should be --chip;--.
- (B) Line 7, "chip," should be --chip;--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1 – 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. (U. S. Pat. No. 6,522,015) in view of Hsuan et al. (U. S. Pat. No. 6,239,366).

Regarding claim 1, Glenn et al. discloses in e.g., Fig. 7 a micromachine package comprising:

- a first chip (452FC; column 9, lines 21 – 22);
- a second chip (412; micromachine chip and column 9, line 23) having a plurality of pads (416; column 9, line 30) disposed on one side of the second chip (see Fig. 7);
- at least one moveable structure (column 1, lines 11 – 15) disposed on one of the first chip and the second chip;
- at least one electrode (any electrodes i.e., an electrode in transistor under the chip 452FC) for cooperating with the moveable structure and disposed on one of the first chip and the second chip;

Art Unit: 2815

- a spacer ring (650; column 10, lines 30 – 57) disposed between the first chip and the second chip and surrounding the moveable structure (column 10, lines 48 – 57);
- a plurality of leads (472; column 10, line 6) each defining a first lead surface connected to the bump, and an opposite second lead surface; and
- an encapsulant (510A; column 10, line 58) encapsulating the first chip, the second chip, the spacer ring, the bumps, and the first lead surfaces of the leads, wherein the second lead surfaces of the leads are exposed out of the encapsulant (see Fig. 7).

While Glenn et al. teaches the leads and the pads (416) on the chip (412), Glenn et al. does not provide a plurality of bumps between the pads and the leads. Hsuan et al. teaches in e.g., Fig. 3B a plurality of bumps (70; column 3, line 65) between pads (68; column 3, line 63) and leads (56; column 3, line 53). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the bumps as the specific connection method between the pads and the leads of Glenn et al. as taught by Hsuan et al. to design an area array layout distributed on the chip to be applied in a semiconductor with a high integration and many I/O nodes (column 3, line 66 – column 4, line 2).

Regarding claim 2, while Glenn et al. discloses in e.g., Fig. 7 a die pad (470; column 7, line 26) defining a first die-pad surface and an opposite second die-pad surface, wherein the first die-pad surface is connected to the first chip (see Fig. 7), Glenn et al. does not teach the second die-pad surface of the die pad being exposed out of the encapsulant. Hsuan et al. teaches in e.g., Fig. 4C the second die-pad surface of a die pad (88b) being exposed out of an encapsulant (76; column 4, lines 25 – 26). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to remove the portion of the encapsulant of Glenn et al. to expose

Art Unit: 2815

the second die-pad surface of a die pad out of the encapsulant as taught by Hsuan et al. to improve heat dissipation and to reduce the thickness of the package (column 5, lines 20 – 22).

Regarding claim 3, Glenn et al. discloses in e.g., Fig. 7 an adhesive (column 7, line 27) for attaching the first chip to the die pad (column 7, lines 24 – 26).

Regarding claim 5, Glenn et al. discloses in e.g., Fig. 7 a plurality of solder balls (612; column 9, lines 34 – 36) for electrically connecting the first chip to the second chip (see Fig. 7).

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Hsuan et al. as applied to claim 1 above, and further in view of Hikita et al. (U. S. Pat. No. 6,133,637).

While Glenn et al. and Hsuan et al. disclose the use of the lead, Glenn et al. and Hsuan et al. do not appear to provide any example of the lead's specific shape. Hikita et al. teaches in Fig. 6 and column 5, lines 34 – 37 leads (12b; column 5, line 35) may be bent flush in plane with a back surface of the package body (22; encapsulant). It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply the bent lead as the specific shape to form the lead of Glenn et al. and Hsuan et al. as taught by Hikita et al. to complete a semiconductor device (column 5, line 37).

11. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Hsuan et al. as applied to claim 1 above, and further in view of Masayuki et al. (U. S. Pat. No. 5,587,341).

Art Unit: 2815

Regarding claims 6 and 7, while Glenn et al. and Hsuan et al. disclose the use of the bump, Glenn et al. and Hsuan et al. do not appear to provide any example of the bump's specific composition. Masayuki et al. teaches in column 5, lines 52 and 53 the bump material may be composed of a solder and/or gold. It would have been obvious to one of ordinary skill in the art at the time when the invention was made to apply solder and/or gold as the specific material to form the bump between the pad and the lead of Glenn et al. and Hsuan et al. as taught by Masayuki et al. to improve an attachment between the pad and the lead and to provide I/O the data of the semiconductor chip to the lead (column 5, lines 62 – 63).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Glenn, Otani, Karpman et al., Martin et al. and Shook disclose a micromachine package.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is 571-272-1724. The examiner can normally be reached on 11:30 - 8:00.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 571-272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2815

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chris C. Chu
Examiner
Art Unit 2815

c.c.
Thursday, May 12, 2005


GEORGE ECKERT
PRIMARY EXAMINER